

CLAIMS

1. An inverted portal drive axle comprising:
 - a driving input;
 - a first wheel assembly driven by said driving input about a wheel axis of rotation;
 - a second wheel assembly laterally spaced from said first wheel assembly and driven by said driving input about said wheel axis of rotation;
 - an axle housing extending underneath a vehicle floor between said first and second wheel assemblies; and
 - at least one axle shaft operably coupled to said driving input and operably coupled to drive at least one of said first and second wheel assemblies wherein said axle shaft is positioned between the vehicle floor and said axle housing.
2. The inverted portal drive axle as set forth in claim 1 wherein said axle housing includes an external surface facing the vehicle floor and an interior surface defining an enclosed cavity and wherein a central portion of said axle shaft is positioned outside said enclosed cavity between said external surface and the vehicle floor.
3. The inverted portal drive axle as set forth in claim 1 wherein said axle housing includes an externally formed ledge extending in a direction parallel to said wheel axis of rotation, said ledge comprising a horizontal surface transitioning into a vertical surface wherein said horizontal surface is positioned immediately underneath said axle shaft and said vertical surface is positioned immediately adjacent to one side of said axle shaft.

4. The inverted portal drive axle according to claim 1 wherein said driving input is positioned laterally closer to said first wheel assembly than to said second wheel assembly and wherein said axle shaft includes a first end coupled to said driving input, a second end coupled to said second wheel assembly, and an exposed central portion interconnecting said first and second ends.
5. The inverted portal drive axle as set forth in claim 4 wherein at least a portion of said first and second ends are enclosed within said axle housing.
6. The inverted portal drive axle as set forth in claim 5 including a first seal assembly in sealing engagement between said first end and said axle housing and a second seal assembly in sealing engagement between said second end and said axle housing.
7. The inverted portal drive axle as set forth in claim 4 wherein said axle shaft comprises a first axle shaft having said first end driven by said driving input and said second end coupled to said second wheel assembly and a second axle shaft having a third end driven by said driving input and a fourth end coupled to said first wheel assembly, said first axle shaft being significantly longer than said second axle shaft.
8. The inverted portal drive axle as set forth in claim 1 wherein said axle shaft is non-collinear with said wheel axis of rotation.

9. An inverted portal drive axle comprising:
 - a driving input;
 - a first axle shaft having a first end coupled to said driving input and a second end coupled to a first gear box;
 - a first wheel assembly driven by said first gear box;
 - a second axle shaft having a first end coupled to said driving input and a second end coupled to a second gear box wherein said second axle shaft is significantly longer than said first axle shaft;
 - a second wheel assembly driven by said second gear box; and
 - an axle housing extending underneath a vehicle floor between said first and second gear boxes, said axle housing having an exterior surface facing the vehicle floor and an interior surface defining an enclosed cavity wherein a central portion of said second axle shaft is positioned outside of said enclosed cavity directly between said external surface and the vehicle floor.

10. The inverted portal drive axle as set forth in claim 9 wherein said first and second wheel assemblies define a wheel axis of rotation and said first and second axle shafts define an axle shaft axis of rotation that is parallel to and spaced apart from said wheel axis of rotation.

11. The inverted portal drive axle as set forth in claim 10 wherein said driving input comprises a differential driven by a vehicle power source, said differential being positioned laterally closer to said first wheel assembly than to said second wheel assembly.

12. The inverted portal drive axle as set forth in claim 11 wherein said first end of said first axle shaft is enclosed within said enclosed cavity and said second end of said first axle shaft is enclosed within said first gear box.

13. The inverted portal drive axle as set forth in claim 12 wherein at least a portion of said first and second ends of said second axle shaft are enclosed within said cavity and wherein said second axle shaft includes an exposed central portion extending underneath the vehicle floor that interconnects said first and second ends.

14. The inverted portal drive axle as set forth in claim 13 including a first seal assembly in sealing engagement between said first end of said second axle shaft and said axle housing and a second seal assembly in sealing engagement between said second end of said second axle shaft and said axle housing.

15. The inverted portal drive axle as set forth in claim 11 wherein said axle housing includes an externally formed ledge extending in a direction parallel to said wheel axis of rotation, said ledge comprising a horizontal surface transitioning into a vertical surface to form an L-shaped recess, said central portion of said second axle shaft being received within said recess.